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COMMITTEE OF EXPERTS ON THE TRANSPORT OF DANGEROUS GOODS

Sub-Committee of Experts on the Transport of Dangerous Goods
(Thirteenth session,
Geneva, 7-17 July 1997,
agenda item (3 (d))

DRAFT AMENDMENTS TO THE MODEL REGULATIONS ON THE TRANSPORT OF DANGEROUS GOODS

Other draft amendments

Reclassification of UN 2054, Morpholine */

Transmitted by the Expert from the United States of America

1. The Expert from the United States has determined that Morpholine, UN 2054, meets the criteria for Class 8, Packing Group I in addition to the criteria for Class 3, Packing Group II. The attached data sheet supports this position. On this basis it is proposed that Morpholine, UN 2054 be assigned to Class 8, Packing Group I with a Class 3 subsidiary risk.

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*/ *Note by the secretariat: The Committee at its nineteenth session agreed that proposals concerning listing and classification should be restricted to the classification of new substances, and that reclassification of existing substances should be avoided as far as possible as long as the process of global harmonization has not been completed (ST/SG/AC.10/23, para. 212).*

Proposal

2. The following amendments are proposed:

a) In the Dangerous Goods List amend the entry for Morpholine as follows:

UN No.	Name and Description	Class or Division	Subsidiary risk	UN packing group	Special provisions	Limited Quantities	Packagings and IBC's		Portable Tanks	
							Packing Instruction	Special Require-ments	Portable Tank Instruction	Special Require-ments
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
2054	MORPHOLILNE	8	3	I		NONE	P001		T20	TP2

(b) Revise the Alphabetical Index of Substances and Articles as follows:

MORPHOLINE 8 2054

Figure 1.1

DATA SHEET FOR SUBSTANCES SUBMITTED TO THE UNITED NATIONS FOR NEW OR AMENDED CLASSIFICATION

Submitted by David L. Ford, Huntsman Corporation
Date: April 17, 1997

Section 1. SUBSTANCE IDENTITY

1.1 Chemical name. . . . . **MORPHOLINE** . . . . . .

1.2 Chemical formula . . . . . C_4H_9NO . . . . . .

1.3 Other names/synonyms. . . .TETRA-HYDRO-1, 4 OXAZINE . . . . . .

1.4.1 UN number . . .2054 . . . . . 1.4.2 CAS number. . .110-91-8 . . . . . .

1.5 Proposed classification for the Recommendations

1.5.1 proper shipping name (13.8 */) MORPHOLINE

1.5.2 class/division . . .8 . . . . . subsidiary risk(s). . . . 3 . . . . . .

packing group . . .I . . . . . .

1.5.3 proposed special provisions, if any . . .NONE . . . . . .

1.5.4 proposed packing method . . .P001 . . . . . .

Section 2. PHYSICAL PROPERTIES

2.1 Melting point or range -5 °C

2.2 Boiling point or range 128.3 °C

2.3 Relative density at :

2.3.1 15 °C 1.007

2.3.2 20 °C 1.003

2.3.3 50 °C 975

THAT IS SPECIFIC GRAVITY RELATED TO WATER

2.4 Vapour pressure at :

2.4.1 50 °C 5.3 kPa

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*/ *This and similar references are to chapters and paragraphs in the Recommendations of the United Nations Committee of Experts on the Transport of Dangerous Goods (ninth revised edition).*

2.4.2 65 °C 10.6 kPa

2.5 Viscosity at 20 °C (1.10 */) $2.3x10^{6}$ m^2/s

2.6 Solubility in water at 20 °C .... g/100 ml INFINITELY SOLUBLE

2.7 Physical state at 20 °C (1.10 and 1.15 */) **liquid**

2.8 Appearance at normal carriage temperatures, including colour and odour

COLORLESS LIQUID; AMMONIA-LIKE ODOR

2.9 Other relevant physical properties NONE

Section 3. FLAMMABILITY

3.1 Flammable vapour

3.1.1 Flash point (5.4 */) 35. . . °C oc/cc
3.1.2 Is combustion sustained? (5.7 */) yes

3.2 Autoignition temperature 310 °C

3.3 Flammability range (LEL/UEL) 1.8/10.8%

3.4 Is the substance a flammable solid ? no

3.4.1 If yes, give details (also complete 4.5.1 and 4.5.2 if relevant)(1.21 */)

Section 4. CHEMICAL PROPERTIES

4.1 Does the substance require inhibition/stabilization or other treatment such as nitrogen blanket to prevent hazardous reactivity ? no

If yes, state

4.1.1 Inhibitor/stabilizer used
4.1.2 Alternative method
4.1.3 Time effective at 55 °C
4.1.4 Conditions rendering it ineffective

4.2 Does the substance react with water ? no

4.2.1 If yes, state effects

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*/ *This and similar references are to chapters and paragraphs in the Recommendations of the United Nations Committee of Experts on the Transport of Dangerous Goods (ninth revised edition).*

4.3 Does the substance have explosive properties ? (4 */) no

4.3.1 If yes, give details . . . . . .

4.4 Does the substance have oxidizing properties ? (1.22 */) no

4.4.1 If yes, give details . . . . . .

4.5 Is the substance a self-reactive substance (1.21 */) or an organic peroxide (1.22*/)? no

If yes, is temperature control required (11.3.5/14.2.2.5 */)? no

If yes state

4.5.1 proposed control temperature (11.3.5.3 */) . . . . °C

4.5.2 proposed emergency temperature (11.3.5.3 */) . . . . °C

4.6 Corrosivity (8 */) to :

4.6.1 mild steel < 3. . mm/year at . . . . °C

4.6.2 aluminium < 3. . mm/year at . . . . °C

4.6.3 other packaging materials (specify) . . . . . < 3 . mm/year at . . . . °C

4.7 Other relevant chemical properties CORROSIVE TO ALUMINUM AT ROOM TEMPERATURES ABOVE 66.6 °C OR WHEN IN AQUEOUS SOLUTIONS . . . . . .

Section 5. HARMFUL BIOLOGICAL EFFECTS

5.1 LD 50, oral (6.2.1*/) 1050 . mg/kg Animal species RAT . . . . . .

5.2 LD 50, dermal (6.2.2*/) 500. . mg/kg Animal species . . . . . .

5.3 LC 50, inhalation (6.2.3*/) N/D. . mg/litre Exposure time . . . . . hours

or . . . ml/m^3 Animal species . . . . . .

5.4 Saturated vapour concentration at 20 °C (6.3.3 */) . .N/D . . ml/m^3
8.0/8.0 DRAIZE

**/ This and similar references are to chapters and paragraphs in the Recommendations of the United Nations Committee of Experts on the Transport of Dangerous Goods (ninth revised edition).*

5.5 Skin exposure (8 */) results CORROSIVE Exposure time 4 HOURS . . . . . hours/minutes
PACKING GROUP I Animal species RABBIT . . . . . .

5.6 Other data . . . . . .
. . . . . .

5.7 Human experience NOT KNOWN . . . . . .
. . . . . .

Section 6. SUPPLEMENTARY INFORMATION

6.1 Recommended emergency action

6.1.1 Fire (include suitable and unsuitable extinguishing agents)

USE WATER SPRAY, DRY CHEMICAL, ALCOHOL RESISTANT FOAM OR CARBON DIOXIDE TO EXTINGUISH FIRE . . . . . .

6.1.2 Spillage CONTAIN SPILL IF POSSIBLE, REMOVE WITH INERT ABSORBENT, PREVENT ENTRY INTO SEWERS AND WATERWAYS . . . . . .

6.2 Is it proposed to transport the substance in :

6.2.1 Intermediate Bulk Containers (16 */) ? no

6.2.2 Multimodal tanks (12 */) ? yes

If yes, give details in Sections 7 and/or 8.

Section 7. INTERMEDIATE BULK CONTAINERS (IBCs) (only complete if yes in 6.2.1)

7.1 Proposed type(s) None - PG I liquids are not authorized in IBCs.

Section 8. MULTIMODAL TANK TRANSPORT (only complete if yes in 6.2.2)

8.1 Description of proposed tank (including IMO tank type if known)
IMO TYPE I or TYPE 1M-101 (US-DOT) . . . . . .
TANK MATERIAL TO BE STAINLESS STEEL . . . . . .

8.2 Minimum test pressure 4 BAR . . . . . .

8.3 Minimum shell thickness 6mm . . . . . .

8.4 Details of bottom openings, if any NO BOTTOM OPENINGS . . . . . .

8.5 Pressure relief NORMAL TYPE PRECEDED BY A FRANGIBLE DISC IN SERIES . . . . . .

8.6 Degree of filling FILLING IAW 4.2.1.9.3 -TP2 . . . . . .

8.7 Unsuitable construction materials ALUMINUM . . . . . .

**/ This and similar references are to chapters and paragraphs in the Recommendations of the United Nations Committee of Experts on the Transport of Dangerous Goods (ninth revised edition).*

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COMMITTEE OF EXPERTS ON THE TRANSPORT OF DANGEROUS GOODS

Sub-Committee of Experts on the Transport of Dangerous Goods
(Thirteenth session, Geneva, 7-17 July 1997, agenda item (3 (b))

DRAFT AMENDMENTS TO THE MODEL REGULATIONS ON THE TRANSPORT OF DANGEROUS GOODS

Use of packagings and IBCs

Packing Instructions and Special Provisions

Transmitted by the Expert from the United States of America

1. During the nineteenth session of the UN Committee of Experts, the expert from the United States of America agreed to develop packing instructions for incorporation in the Recommendations. In this proposal, the expert from the United States of America has developed packing instructions covering packagings, intermediate bulk containers (IBCs) and special packaging provisions for substances in classes 2-9 for consideration by the Sub-Committee at its thirteenth session. These are intended to supplement the packing instructions already contained in the tenth revised edition of the Recommendations covering explosives, infectious substances, organic peroxides and self-reactive substances. A method for assigning packing instructions to specific substances and groups of substances was also developed as a means for completing columns 8 and 9 of the Dangerous Goods List. The expert from the United States is prepared to enter the packing instructions and special packaging provisions in columns 8 and 9 of the Dangerous Goods List if the Sub-Committee agrees with this proposal. The proposed packing instructions, special packaging provisions and method for assigning packing instructions are provided in Annexes 1 to 5.

2. The proposed packing instructions include five general packing instructions which can be applied to the majority of substances in Classes 2, 3, 5, 6, 8 and 9. Additional packing instructions where developed for substances which require special packaging consideration primarily because of the unique hazards they pose in transportation and because only certain packagings are acceptable for these substances. Packing instructions for Division 6.1 toxic by inhalation (TIH) substances will be addressed in a separate proposal. Packing instructions for articles are not included because the expert from the United Kingdom has agreed to address them. IBC packing instructions were developed taking into account the requirements in the International Maritime Dangerous Goods (IMDG) Code, the proposed restructured RID/ADR and the U.S. Hazardous Materials Regulations. A total of six IBC packing instructions were developed.

3. The packing instructions are intended to be supplemented by special packaging provisions in column 9 of the Dangerous Goods List. The proposed packaging provisions are provided in the Annex 3 to this proposal. In further work efforts it may be necessary to review all the packaging provisions (e.g. those currently listed under column 6 of the Dangerous goods List) and consolidate them under column 9. Further work in assigning special packaging provisions to specific entries in the Dangerous Goods List will also be necessary.

4. The proposed packing instruction numbers consist of three digit numbers with the first digit of the specialized packing instructions representing the Class of the substances covered. This is consistent with the numbering of packing instructions contained in the tenth revised edition of the Recommendations. However, taking into account the proposed restructured RID/ADR, the letter "P" has been used to indicate packing instruction to clearly distinguish the coding from other codes in the Dangerous Goods List. In the same manner, packing instructions for IBCs have been preceded with the letters "IBC". Special provisions relative to packaging requirements are proposed to be referred to as special packaging provisions. Special packaging provisions are proposed as numeric codes and IBC special packaging provisions are proposed to be numeric codes preceded by a "B".

5. The Sub-Committee is requested to consider this proposal for incorporation in the eleventh revised edition of the UN Recommendations.

ANNEX 1

PROPOSED PACKING INSTRUCTIONS

P001	PACKING INSTRUCTION	P001

The general packing provisions of 4.1.1 shall be met. Each packaging shall conform to the requirements of Chapter 6.1. The maximum capacity and net mass limits specified in 6.1.4 shall not be exceeded.
The following packagings are authorized:

Combination Packagings:

INNER:	**OUTER**:		
Glass or earthenware receptacles	Drums Steel: 1A1, 1A2	Boxes Steel: 4A,	Jerricans Steel: 3A1, 3A2
Plastics receptacles	Aluminium: 1B1, 1B2	Aluminium: 4B,	Aluminium: 3B1,3B2
Metal receptacles	Metal other than steel or aluminium: 1N1, 1N2	Natural wood: 4C1,4C2	Plastics: 3H1, 3H2
	Plastics: 1H1, 1H2	Plywood: 4D	
	Plywood: 1D	Reconstituted wood: 4F	
	Fibre: 1G	Fibreboard: 4G	
		Expanded plastics: 4H1	
		Solid plastics: 4H2	

Single or Composite Packagings:
Steel drum: 1A1 or 1A2
Aluminium drum: 1B1 or 1B2
Metal drum other than steel, or aluminium: 1N1 or 1N2
Plastics drum: 1H1 or 1H2
Fibre drum: 1G (with liner or coating if used for liquids)
Steel jerrican: 3A1 or 3A2
Plastics jerrican: 3H1 or 3H2
Steel box with liner (**for solids only**)
Aluminium box with liner (**for solids only**)
Natural wood box, sift-proof: 4C2 (**for solids only**)
Plastics receptacle in steel, aluminium, fibre or plastics drum: 6HA1, 6HB1, 6HG1, 6HH1
Plastics receptacle in steel, aluminium, wood, plywood or fibreboard box: 6HA2, 6HB2, 6HC, 6HD2 or 6HG2
Glass, porcelain or stoneware receptacle in steel, aluminium or fibre drum: 6PA1, 6PB1 or 6PG1
Glass, porcelain or stoneware receptacle in steel, aluminium, wood or fibreboard box: 6PA2, 6PB2, 6PC or 6PG2
Glass, porcelain or stoneware receptacle in solid or expanded plastics packaging: 6PH1 or 6PH2

Compressed Gas Cylinders:
Compressed gas cylinders approved by the competent authority are authorized.

P002	PACKING INSTRUCTION P002	P002

The general packing provisions of 4.1.1 shall be met. Each packaging shall conform to the requirements of Chapter 6.1. The maximum capacity and net mass limits specified in 6.1.4 shall not be exceeded.
The following packagings are authorized:

Combination Packagings:

INNER:	**OUTER**:		
Glass or earthenware	Drums	Boxes	Jerricans
receptacles	Steel: 1A1, 1A2	Steel: 4A,	Steel: 3A1, 3A2
Plastics receptacles	Aluminium: 1B1, 1B2	Aluminium: 4B,	Aluminium: 3B1,3B2
Metal receptacles	Metal other than steel	Natural wood: 4C1,4C2	Plastics: 3H1, 3H2
Paper receptacles	or aluminium: 1N1, 1N2	Plywood: 4D	
Paper bags, sift-proof	Plastics: 1H1, 1H2	Reconstituted wood: 4F	
Plastics bags	Plywood: 1D	Fibreboard: 4G	
Textile bags, sift-proof	Fibre: 1G	Expanded plastics: 4H1	
		Solid plastics: 4H2	

Single or Combination Packagings:
Steel drum: 1A1 or 1A2
Aluminium drum: 1B1 or 1B2
Metal drum other than steel, or aluminium: 1N1 or 1N2
Plastics drum: 1H1 or 1H2
Fibre drum: 1G
Steel jerrican: 3A1 or 3A2
Plastics jerrican: 3H1 or 3H2
Steel box with liner
Aluminium box with liner
Natural wood box: 4C1, 4C2
Plywood box: 4D
Reconstituted wood box: 4F
Fibreboard box: 4G
Expanded plastics box: 4H1
Solid plastics box: 4H2
Bag, woven plastics: 5H1, 5H2 or 5H3
Bag, plastics film: 5H4
Bag, textile: 5L1, 5L2 or 5L3
Bag, paper, multiwall, water resistant: 5M2
Plastics receptacle in steel, aluminium, plywood, fibre or plastics drum: 6HA1, 6HB1, 6HD1, 6HG1, 6HH1
Plastics receptacle in steel, aluminium, wood, plywood, fibreboard or solid plastics box: 6HA2, 6HB2, 6HC, 6HD2, 6HG2 or 6HH2
Glass, porcelain or stoneware receptacle in steel, aluminium, plywood or fibre drum: 6PA1, 6PB1, 6PD1 or 6PG1
Glass, porcelain or stoneware receptacle in steel, aluminium, wood or fibreboard box: 6PA2, 6PB2, 6PC or 6PG2
Glass, porcelain or stoneware receptacle in solid or expanded plastics packaging: 6PH1 or 6PH2

P003	PACKING INSTRUCTION	P003

The general packing provisions of 4.1.1 shall be met. Each packaging shall conform to the requirements of Chapter 6.1. The maximum capacity and net mass limits specified in 6.1.4 shall not be exceeded unless otherwise specified. Any appropriate packaging conforming to the general packing requirements may be used.

P004	PACKING INSTRUCTION	P004

Only packagings which are approved by the competent authority may be used.

P200	PACKING INSTRUCTION	P200

(1) Compressed gas cylinders and gas receptacles conforming to the construction, testing and filling requirements approved by the competent authority are authorized. The general packing provisions of Chapter 4.1 shall be met. Packagings need not conform to the testing and marking requirements of Chapter 6.1.

(2) The following additional general requirements shall be met:

(a) Compressed gas cylinders and gas receptacles shall be constructed to withstand at least 1.5 times the internal pressure to which they are subjected under normal conditions of transport without any risk of bursting, cracking or permanent deformation;

(b) The closing devices (valves, plugs, etc.) shall be fitted to the pressure vessel in a manner as to ensure complete tightness under the internal pressure described in (b)(1). The design of the valve and the material of which it is made shall be such that its tightness is not impaired under normal conditions of transport, and it shall be subjected to a test pressure not less than that required by the cylinder or receptacle to which it will be fitted;

(c) Cylinders and receptacles with capacities of one litre or less shall be packed in strong outer packagings and secured or cushioned so as to prevent significant movement within the outer packaging during normal conditions of transport;

(3)Compressed gas cylinders and gas receptacles shall have their valves protected by one of the following methods:

(a) By equipping the cylinders and receptacles with securely attached metal caps of sufficient strength to protect the valves from injury during transit;

(b) By boxing or crating the cylinders and receptacles so that the valves are protected. These outer packagings shall be marked and labelled in accordance with the consignment procedures in Part 5;

(c) By so constructing the containers that the valve is recessed into the container or otherwise protected so that it will not be damaged when the container is dropped on a flat surface;

(d) By loading the containers compactly in an upright position and providing secure restraint (e.g. blocking and bracing) in transport units, when loaded by the consignor and unloaded by the consignee;

(e) By equipping with valves strong enough to avoid damage during transit for containers containing non-liquefied gas under pressure not exceeding 300 psi (2 MPa) (20 bar) at 20 °C.

*A special provision indicating that for some substances (e.g. Nitric oxide, bromine pentafluoride, etc.) compressed gas cylinders shall not be equipped with pressure release devices will be applied to appropriate substances (see Annex 3).

P201	PACKING INSTRUCTION	P201

This packing instruction applies to ethyl chloride. The general packing provisions of 4.1.1 shall be met. Except for compressed gas cylinders, the packaging shall conform to the requirements of Chapter 6.1 at the Packing Group I performance level. The maximum capacity and net mass limits specified in 6.1.4 shall not be exceed unless otherwise specified.
The following single or combination packagings are authorized:

(1) Wooden boxes (4C1, 4C2, 4D or 4F) with glass, earthenware, or metal inner receptacles with a maximum net mass of 500 g each;

(2) Fibreboard boxes (4G) with glass, earthenware, or metal inner receptacles with a maximum net mass of 500 g each. The gross mass of the package shall not exceed 30 kg;

(3) Drums (1A1) not more than 100 L capacity each; or

(4) Compressed gas cylinders approved by the competent authority as specified in P200.

P202	PACKING INSTRUCTION	P202

This packing instruction applies to ethylene oxide. The general packing provisions of 4.1.1 shall be met. Except for compressed gas cylinders the packaging shall conform to the requirements of Chapter 6.1 at the Packing Group I performance level. The maximum capacity and net mass limits specified in 6.1.4 shall not be exceeded unless otherwise specified. The following packagings are authorized:

(1) Fibreboard boxes (4G) with inner glass receptacles. The total quantity of ethylene oxide shall not exceed 100 grams per package;

(2) Fibreboard boxes (4G) with inner packagings consisting of aluminium receptacles with a maximum net mass of 135 g capacity each. Inner packaging shall be placed in non-combustible cushioning material. Not more than 12 receptacles may be packed in one box, and not more than 10 boxes may be overpacked in a single overpack;

(3) Wooden boxes (4C1, 4C2, 4D or 4F) or fibreboard boxes (4G) with inner metal receptacles with a maximum net mass of 340 g each. The metal receptacle shall be capable of withstanding not less than a 1240 kPa burst pressure. Not more than 12 receptacles may be packed in one box, and each receptacle may not be liquid full below 70 °C. Each inner receptacle shall be insulated and equipped with a relief device of the fusible plug type with yield temperature of 69 °C to 77 °C.

(4) Compressed gas cylinders approved by the competent authority as specified in P200. Insulation is required for cylinders over 4 L capacity. Cylinders shall be seamless or welded steel (not brazed) with a capacity of not more than 115 L and may not be liquid full below 70°C. Before each refilling, each cylinder shall be tested for leakage at no less than 100 kPa. In addition, each cylinder shall be equipped with a fusible type relief device with yield temperature of 69 °C to 77 °C.

(5) Steel drums (1A1) with a capacity of not more than 230 L each. The drum shall be lagged, of all welded construction with the inner shell having a minimum thickness of at least 1.7 mm and the outer shell having a minimum thickness of at least 2.4 mm. Drums shall be capable of withstanding a hydrostatic test pressure of 690 kPa. Lagging shall be of sufficient thickness so that the drum, when filled with ethylene oxide and equipped with the required pressure relief device, will not rupture when exposed to fire. The drum may not be liquid full below 70 °C, and shall be marked "THIS END UP'' on the top head. Before each refilling, each drum shall be tested for leakage at a pressure not less than 100 kPa. Each drum shall be equipped with a fusible type relief device with yield temperature of 69 °C to 77 °C.

P400	PACKING INSTRUCTION	P400

This packing instruction applies to certain Class 4 liquids. The general packing provisions of 4.1.1 shall be met. Except for cylinders and their overpacks, each packaging shall conform to the requirements of Chapter 6.1.
The following packagings are authorized:

(1) Compressed gas cylinders having a minimum design pressure of 1200 kPa conforming to the construction, testing and filling requirements approved by the competent authority. Cylinder valves shall be protected with steel valve protection caps or collars or the cylinders shall be overpacked in strong wood, fibreboard or plastics boxes. Cylinders shall be secured to prevent movement in the box and shall be packaged and transported so that pressure relief devices remain in the vapour space of the cylinder during normal conditions of handling and transport.

(2) Wooden boxes (4C1, 4C2, 4D, or 4F) or fibreboard boxes (4G) enclosing not more than four strong, tight metal cans with inner packagings of glass or metal, with a capacity of not more than 1 L each, having positive threaded closures which are adequately gasketed. Inner packagings shall be cushioned on all sides with dry, absorbent, incombustible material in a quantity sufficient to absorb the entire contents. The strong, tight metal cans shall be closed by positive means, not by friction.

(3) Steel drums (1A2) or fibre drums (1G) with a capacity of not more than 220 L each with strong tight inner metal cans not more than 4.0 L capacity each, closed by positive means, not friction.

(a) Inner packagings shall have no opening exceeding 25 mm diameter and shall be surrounded with non-combustible cushioning material;

(b) The net quantity of pyrophoric liquids may not be greater than two-thirds of the rated capacity of the outer drum. For example, a 220 L outer drum shall contain less than 150 L of pyrophoric liquids;

(c)Each layer of inner containers shall be separated by a metal plate dividing partition in addition to cushioning material.

P401	PACKING INSTRUCTION	P401

This packing instruction applies to certain Class 4 solids. The general packing provisions of 4.1.1 shall be met. Each packaging shall conform to the requirements of Chapter 6.1.
The following packagings are authorized:

(1) Wooden boxes (4C1, 4C2, 4D, or 4F) with inner metal packagings which have a positive (not friction) means of closure. The net mass of pyrophoric substance per wooden box shall not exceed 15kg.

(2) Steel drums (1A1 or 1A2) with a maximum gross mass of 150 kg each.

(3) Fibreboard boxes (4G) with inner metal packagings which have a positive (not friction) means of closure. The net mass of pyrophoric substance per fibreboard box shall not exceed 7.5 kg.

(4) Fibre drums (1G) with inner metal packagings which have a positive (not friction) means of closure. The net mass of pyrophoric substance per fibre drum shall not exceed 15 kg.

(5) Plywood drums (1D) with inner metal packagings which have a positive (not friction) means of closure. The net mass of pyrophoric substance per plywood drum shall not exceed 15 kg.

P402	PACKING INSTRUCTION	P402

This packing instruction applies to white and yellow phosphorus. The general packing provisions of 4.1.1 shall be met. Phosphorus, white or yellow shall be packed in water or dry in packagings conforming to the requirements of Chapter 6.1 at the Packing Group I performance level.
The following packagings are authorized:

(1) When placed in water:

(a) Wooden boxes (4C1, 4C2, 4D, or 4F) with:

(i) inner hermetically sealed (soldered) metal cans, enclosed in other hermetically sealed (soldered) metal cans, or

(ii) inner water-tight metal cans containing not more than 0.5 kg of phosphorus with screw-top closures; or

(b) Steel drums (1A1) with a capacity of not more than 250 L each or steel drums (1A2) with a capacity of not more than 115 L each.

(2) When dry, it shall be cast solid and transported in packagings as follows:

(a) Steel drums (1A2) with a capacity of not more than 115 L each; or

(b) In projectiles or bombs when transported by, for, or to the military agencies as specified by the competent authority, without bursting elements or means of initiation.

P403	PACKING INSTRUCTION	P403

This packing instruction applies to Barium Azide, wetted. The general packing provisions of 4.1.1 shall be met. Each packaging shall conform to the requirements of Chapter 6.1 at the Packing Group I performance level. The maximum net mass limits specified in section 6.1.4 shall not be exceeded unless otherwise specified. Wooden boxes (4C1, 4C2, 4D, or 4F) or fibre drums (1G) with inner glass packagings with a maximum net mass of 0.5 kg each are authorized. Inner packagings shall have rubber stoppers wire tied for securement or other equivalent means of closure. A suitable antifreeze solution shall be used to prevent freezing when necessary.

P404	PACKING INSTRUCTION	P404

This packing instruction applies to certain desensitized explosives. The general packing provisions of 4.1.1 shall be met. Each packaging shall conform to the requirements of Chapter 6.1 at the Packing Group I performance level. The following packagings are authorized:

(1) Combination packagings with outer packagings consisting of wooden boxes (4C1, 4C2, 4D, or 4F), fibreboard boxes (4G) or fibre drums (1G) with glass, plastics or metal inner packagings. The gross mass of the package shall not exceed 125 kg.

(2) Single packagings as follows:

(a) wooden boxes (4C1, 4C2, 4D, 4F) with a gross mass not exceeding 125 kg;

(b) fibre drums (1G) with inner liners with a gross mass not exceeding 50 kg;

(c) steel drums (1A2) with a gross mass not exceeding 225 kg.

(3) Alternative packagings approved by the competent authority are permitted.

P603	PACKING INSTRUCTION	P603

This packing instruction applies to Bromoacetone, Methyl bromide, Chloropicrin and Methyl bromide or Methyl chloride mixtures. The general packing provisions of 4.1.1 shall be met.
Except for compressed gas cylinders, each packaging shall conform to the requirements of Chapter 6.1.
The following packagings are permitted:

(1) Bromoacetone shall be packed in wooden boxes (4C1, 4C2, 4D or 4F) with inner glass packagings or tubes placed in hermetically sealed metal packagings within fibreboard packagings. Glass packagings shall not contain more than 500 g of liquid each and shall be cushioned in metal packagings with absorbent material sufficient to absorb the contents of the glass receptacle. The total net quantity of liquid per package box shall not exceed 11 kg. Packagings shall meet the Packing Group I performance level.

(2) Bromoacetone, methyl bromide, Chloropicrin and methyl bromide mixtures, Chloropicrin and methyl chloride mixtures, and Chloropicrin mixtures charged with non-flammable, non-liquefied compressed gas shall be packed in metal cylinders approved by the competent authority with a water capacity of not more than 113 kg. This capacity does not apply to consignments of methyl bromide.

(3) Methyl bromide mixtures containing up to 2% Chloropicrin shall be packed in fibreboard boxes (4G) with inner metal packagings with a maximum net mass of 0.5 kg each, or inner metal cans with a minimum wall thickness of 0.18 mm with a maximum net mass of 1kg each. The 0.5 kg can shall be capable of withstanding an internal pressure of 900 kPa without leakage or permanent deformation. The vapour pressure of the contents shall not exceed 900 kPa at 55 °C. The 1 kg can shall be capable of withstanding an internal pressure of 965 kPa without leakage or permanent deformation. The vapour pressure of the contents shall not exceed 965 kPa at 55 °C. The metal packagings shall not be liquid full at 55 °C and shall have concave or pressure resistant ends.

P621	PACKING INSTRUCTION	P621

The general provisions of 4.1.1 or 4.1.2 shall be met. Each packaging shall conform to the requirements of Chapter 6.1. Each IBC shall conform to the requirements of Chapter 6.5.
The following packagings are authorized:

Rigid, leakproof packagings or IBCs in accordance with the requirements of Chapters 6.1 or 6.5 for solids, at the Packing Group II performance level, shall be used provided there is sufficient absorbent material to absorb the entire amount of liquid present and the packaging or IBC is capable of retaining liquids. Packages containing larger quantities of liquid shall be carried in rigid packagings or IBCs in accordance with the requirements of Chapters 6.1 or 6.5 respectively at the Packing Group II performance level for liquids. Packagings or IBCs intended to contain sharp objects such as broken glass and needles shall be resistant to puncture and retain liquids under the performance test conditions in Chapters 6.1 for packagings and Chapter 6.5 for IBCs.

P803	PACKING INSTRUCTION	P803

This packing instruction applies to Gallium. The general packing provisions of 4.1.1 shall be met. Except for cylinders and steel flasks, each packaging shall conform to the requirements of Chapter 6.1.

(1) Gallium metal shall be packed in packagings intended to contain liquids consisting of semi-rigid plastics inner packagings with a maximum net mass of 2.5 kg each, individually enclosed in a sealed leak-tight bag of strong puncture-resistant material or glass or rigid plastics packagings with a maximum net mass of 10 kg each. The sealed bags, glass or rigid plastics packagings shall be packed in wooden boxes (4C1, 4C2, 4D, 4F), fibreboard boxes (4G), plastics boxes (4H1, 4H2) fibre drums (1G) or steel drums (1A2), which are lined with leak-tight, puncture-resistant material.
Bags and liner material shall be chemically resistant to gallium.
In order to maintain the gallium in a completely solid state, the above packagings may be overpacked in a strong, water-resistant outer packaging which contains dry ice or other means of refrigeration. If a refrigerant is used, all of the above materials used in the packaging of gallium shall be chemically and physically resistant to the refrigerant and shall have impact resistance at the low temperatures of the refrigerant employed. If dry ice is used, the outer packaging shall permit the release of carbon dioxide gas.
Completed packaging shall meet Packing Group I requirements for transport by aircraft and Packing Group III requirements for all other modes of transport.
The maximum net mass limits specified in section 6.1.4 shall not be exceeded, unless otherwise specified.

(2) Cylinders and steel flasks approved by the competent authority are also authorized.

P804 **PACKING INSTRUCTION** **P804**

This packing instruction applies to Mercury and Mercury contained in manufactured articles. The general packing provisions of 4.1.1. shall be met. Unless otherwise specified, each packaging shall conform to the requirements of Chapter 6.1.

(1) Mercury

Each packaging shall conform to the requirements of Chapter 6.1 at the Packing Group III performance level. The maximum net mass limits specified in section 6.1.4 shall not be exceeded. For transport by aircraft, mercury shall be packed in packagings which meet the requirements of Chapter 6.1 at the Packing Group I performance level. The following packagings are authorized:

(a)Glass, porcelain or stoneware inner packagings with a capacity of not more than 3.5 kg, wooden boxes (4C1, 4C2, 4D, 4F) packed in steel drums (1A2), plywood drums (1D) or fibre drums (1G), steel jerricans (3A2), fibreboard boxes (4G) or solid plastics boxes (4H2) with sufficient cushioning material to prevent breakage. Either the inner packagings or the outer packagings shall have inner liners or bags of strong leakproof and puncture-resistant material impervious to mercury, completely surrounding the contents, which will prevent the escape of mercury from the package irrespective of its position;

(b) Iron or steel "quicksilver flasks" with a capacity of not more than 3.5 kg each packed in steel drums (1A2), steel jerricans (3A2), wooden boxes (4C1, 4C2, 4D, 4F), fibreboard boxes (4G) or solid plastics boxes (4H2), plywood drums (1D) or fibre drums (lG) with leakproof liners as specified in paragraph (a);

(c) Welded steel bottles with inner vaulted bottoms as single packagings. The closure shall be a bolt with a conical thread, and the opening shall not exceed 20 mm. The maximum net mass shall not exceed 35 kg.

(2) Manufactured articles or apparatus

Manufactured articles or apparatuses containing mercury are excepted from the testing and marking requirements of Chapter 6.1 when packed as follows:

(a) Manufactured articles or apparatus of which metallic mercury is a component part, such as manometers, pumps, thermometers, switches, etc. (for electron tubes, mercury vapour tubes and similar tubes, see paragraph (b) below), shall be packed in strong outer packagings, having sealed inner liners or bags of strong leakproof and puncture-resistant material impervious to mercury, which will prevent the escape of mercury from the package irrespective of its position. Mercury switches and relays are excepted from these packaging requirements, if they are totally enclosed, leakproof and in sealed metal or plastics units;

(b) Electron tubes, mercury vapour tubes and similar tubes shall be packed as follows:

(i)Tubes which are packed in strong outer packagings with all seams and joints sealed with self-adhesive, pressure-sensitive tape which will prevent the escape of mercury from the package, are authorized up to a total net quantity of 450 g of mercury per package;

(ii) Tubes with more than 450 g of mercury are authorized only when packed in strong outer packagings, having sealed inner liners or bags of strong leakproof and puncture-resistant material impervious to mercury which will prevent escape of mercury from the package irrespective of its position;

(iii) Tubes which do not contain more than 5 g of mercury each and which are packed in the manufacturer's original packagings, are authorized up to a total net quantity of 30 g of mercury per package;

(iv) Tubes which are completely jacketed in sealed leakproof metal cases are authorized in the manufacturer's original packagings.

(3) The shipper shall indicate the quantity of mercury for electron tubes, mercury vapour tubes, and similar tubes containing mercury on the transport document.

P805	PACKING INSTRUCTION	P805

This packing instruction applies to Nitric acid and nitrating acid mixtures. The general packing provisions of 4.1.1 shall be met.
Each packaging shall conform to the general requirements of Chapter 6.1. For concentrations of more than 70% packagings shall meet the Packing Group I performance level. For concentrations not more than 70 % packagings shall meet the Packing Group II performance level. The maximum net mass limits specified in section 6.1.4 shall not be exceeded unless otherwise specified.
The following requirements apply:

(1) Nitric acid exceeding 40 % concentration may not be packaged with any other material.

(2) Nitric acid in any concentration which does not contain sulfuric acid or hydrochloric acid as impurities may be packed as follows:

(a) In austenitic steel drums (1A1);

(b) In expanded plastics outer packagings (4H1)with no more than four glass inner packagings with a capacity of not more than 2.5 L each packed in one outer packaging; or

(c) Nitric acid with a concentration of 80 % or more may be packed in aluminium drums (1B1).

(3) Nitric acid with a concentration of 90 % or more may be packed in combination packagings as follows:

(a) Wooden boxes (4C1, 4C2, 4D, 4F) with inner glass receptacles individually overpacked in tightly closed metal packagings. The glass receptacles shall be of a capacity of not more than 2.5 L and cushioned with a non-reactive, absorbent material within the metal packagings.

(b) Steel drums (1A2), aluminium drums (1B2), plywood drums (1D), fibre drum (1G) plastics drums (1H2), plastics jerricans (3H2) or fibreboard boxes (4G) with inner glass receptacles with a capacity of not more than 2.5 L each cushioned with a non-reactive, absorbent material and packed within a tightly closed intermediate packaging of metal or plastic.

(4) Nitric acid of less than 90 % concentration may be packaged in wooden boxes (4C1, 4C2, 4D, 4F) or fibreboard boxes (4G) with inner glass receptacles with a capacity of not more than 2.5 L each.

(5) Nitric acid with a concentration of 70 % or less may be packed as follows:

(a) In composite packagings with glass, porcelain or stoneware receptacles (6PA1, 6PA2, 6PB1, 6PB2, 6PC, 6PD1, 6PH1, 6PH2) or composite packaging with plastics inner packagings (6HA1, 6HH1);

(b) In expanded plastics boxes (4H1) with inner glass receptacles with a capacity of not more than 2.5 L each;

(c) In combination packagings consisting of steel drums (1A2), aluminium drums (1B2), plywood drums (1D), fibre drums (1G), plastics drums (1H2), plastics jerricans (3H2), wooden boxes (4C1, 4C2, 4D, 4F) or fibreboard boxes (4G) and the following inner packagings that are overpacked in tightly closed metal packagings:

(i) Glass or earthenware packagings with a capacity of not more than 2.5 L each; or
(ii) Plastics packagings with a capacity of not more than 2.5 L each further individually overpacked in tightly closed metal packagings.

(6) Alternate packagings which offer an equivalent level of safety in transport are authorized when approved by the competent authority.

P900	PACKING INSTRUCTION	P900

This packing instruction applies to Asbestos, blue, brown or white.
The general provisions of 4.1.1 and 4.1.2 shall be met, but the packagings need not conform to the package testing and marking requirements of Chapter 6.1.
The following packagings are authorized:

(1) Rigid, leak tight packagings, such as metal, plastics or fibre drums, IBCs or portable tanks;

(2) Bags or other non-rigid packagings in closed freight containers that are loaded by and for the exclusive use of the consignor and unloaded by the consignee;

(3) Bags or other non-rigid packagings which are sift-proof. Packagings containing asbestos shall be palletized and unitized by methods such as shrink-wrapping in plastics film or wrapping in fibreboard secured by strapping. Pallets need not be used during transportation by vessel for loads with slings that are unitized by methods such as shrink, wrapping, if the slings adequately and evenly support the loads and the unitizing method prevents shifting of the bags or other non-rigid packagings during normal conditions of transport; or

(4) Bags or other non-rigid packagings which are sift-proof in strong outer packagings.

P901	PACKING INSTRUCTION	P901

This packing instruction applies to Carbon dioxide, solid (dry ice).
The general provisions of 4.1.1 and 4.1.2 shall be met, but the packagings need not conform to the testing and marking requirements of Chapter 6.1. For each shipment by air exceeding 2.3 kg per package, advance arrangements shall be made between the shipper and each carrier.

(1) Carbon dioxide, solid (dry ice), when transported by aircraft or water, shall be packed in packagings designed and constructed to permit the release of carbon dioxide gas to prevent a build-up of pressure that could rupture the packagings.

(2)Transport units containing solid carbon dioxide, when transported on board ocean vessels, shall be conspicuously marked on two sides "WARNING CO_2 SOLID (DRY ICE).''

(3) Other packagings containing solid carbon dioxide, when transported on board ocean vessels, shall be marked "CARBON DIOXIDE, SOLID-DO NOT STOW BELOW DECKS.''

(4) Not more than 200 kg of solid carbon dioxide may be transported in any one cargo compartment or bin on any aircraft except by specific and special written arrangement between the shipper and the aircraft operator.

(5) Carbon dioxide, solid (dry ice) is excepted from the shipping paper and certification requirements if the requirements of paragraphs (a) and (d) are complied with and the package is marked "Carbon dioxide, solid'' or "Dry ice'' and is marked with an indication that the substance being refrigerated is used for diagnostic or treatment purposes (e.g., frozen medical specimens).

P902	PACKING INSTRUCTION	P902

This packing instruction applies to fish meal or fish scrap.
Fish meal or fish scrap is not subject to the Recommendations when transported by road or rail. The general provisions of 4.1.1 or 4.1.2 shall apply. When transported by vessel, fish meal or fish scrap, containing at least 5 % but not more than 12 % moisture content, shall be packed in the following packagings:

(1) Bags (5H, 5L or 5M);

(2) IBCs

(3)Freight containers.

(b) Fish meal or fish scrap shall not be transported if the temperature at the time of loading exceeds 35°C or 5°C above the ambient temperature, whichever is higher.

(c) Fish scrap or fish meal shall contain at least 100 ppm of anti-oxidant (ethoxyquin) at the time of shipment.

P903	PACKING INSTRUCTION	P903

This packing instruction applies to polystyrene beads or granules, expandable, impregnated with flammable gas or liquid as a blowing agent and plastics moulding materials in dough, sheet or extruded rope form.The general packing provisions of 4.1.1 shall be met. Each packaging shall conform to the requirements of Chapter 6.1.
The maximum net mass limits specified in section 6.1.4 shall not be exceeded unless otherwise specified.
The following packagings are authorized:
(1) Wooden boxes (4C1, 4C2, 4D, 4F) and fibreboard boxes (4G) with sealed inner plastics liners;
(2) Plywood drums (1) and fibre drums (1G) with sealed inner plastics liner; and
(3) Metal drums (1A1, 1A2, 1B1, 1B2).

ANNEX 2

PACKING INSTRUCTIONS FOR IBCS

IBC01	PACKING INSTRUCTION	IBC01

The general provisions of 4.1.2 shall be met. Each IBC shall conform to the requirements of Chapter 6.5.

(1) The following IBCs are authorized:

(a) Metal IBCs: 31A, 31B and 31N;

(b) Rigid plastics IBCs: 31H1 and 31H2;

(c) Composite IBCs: 31HZ1 and 31HZ2.

(2) Only liquids with a vapour pressure less than or equal to 110 kPa at 50 °C, or 130 kPa at 55 °C, are authorized in metal IBCs.

IBC02	PACKING INSTRUCTION	IBC02

The general provisions of 4.1.2 shall be met. Each IBC shall conform to the requirements of Chapter 6.5.

(1) The following IBCs are authorized:

(a) Composite IBCs: 11HZ1, 11HZ2, 21HZ1 and 21HZ2;

(b) Fibreboard IBCs: 11G;

(c) Flexible IBCs: 13H1, 13H2, 13H3, 13H4, 13H5, 13L1, 13L2, 13L3, 13L4 and 13M2;

(d) Metal IBCs: 11A, 11B, 11N, 21A, 21B and 21N;

(c) Rigid plastics IBCs: 11H1, 11H2, 21H1 and 21H2; and

(e) Wooden IBCs: 11C, 11D and 11F.

(2) The following additional requirements apply to the use of IBCs:

(a) For Packing Group I substances, IBCs shall be transported in closed freight containers or closed transport vehicles;

(b) Flexible, fibreboard and wooden IBCs are intended for the transport of solids only and shall not be used for liquids or materials that may become liquid during transport;

(c) Flexible, fibreboard, wooden IBCs and composite IBCs with a fibreboard outer body, containing Packing Group II substances shall be transported in closed freight containers or closed transport vehicles.

(d) Packing Group I solids are only authorized in metal IBCs with a capacity not exceeding 3 m^3 and in rigid plastics, composite, flexible, fibreboard and wooden IBCs with a capacity not exceeding 1.5 m^3.

IBC03	PACKING INSTRUCTION	IBC03

The general provisions of 4.1.2 shall be met. Each IBC shall conform to the requirements of Chapter 6.5.

(1) The following IBCs are authorized:

(a) Composite IBCs: 11HZ1, 11HZ2, 21HZ1 and 21HZ2;

(b) Metal IBCs: 11A, 11B, 11N, 21A, 21B and 21N; and

(c) Rigid plastics IBCs: 11H1, 11H2, 21H1 and 21H2;

(2) Packing Group I solids are only authorized in metal IBCs with a capacity of not more thant 3 m^3 and in rigid plastics, composite, flexible, fibreboard and wooden IBCs with a capacity of not more than 1.5 m^3.

IBC04	PACKING INSTRUCTION	IBC04

The general provisions of 4.1.2 shall be met. Each IBC shall conform to the requirements of Chapter 6.5.

Only metal IBCs (31A, 31B and 31N) are authorized. Only liquids with a vapour pressure less than or equal to 110 kPa at 50 °C, or 130 kPa at 55 °C, are authorized in IBCs.

IBC05	PACKING INSTRUCTION	IBC05

IBCs are only authorized when approved by the competent authority.

ANNEX 3

SPECIAL PACKING PROVISIONS

Compressed gas cylinder and receptacle special packing provisions

1. Compressed gas cylinders and receptacles shall not be equipped with pressure relief devices. Valve outlets shall be sealed by a solid threaded cap or plug and an inert gasket material.

2. 1A1 metal drums with a capacity not more than 1000 litres which meet Packing Group I performance level requirements may also be used.

3. Compressed gas cylinders and receptacles shall be overpacked in a box or drum in order to protect each valve or other closing device from damage. Each overpack shall be sufficiently strong to protect all parts of each inside cylinder or receptacle from deformation and failure if the completed packaging is dropped 1.8 metres onto a solid unyielding surface at the package's weakest point.

4. Each filled cylinder or receptacle shall be tested for leakage before it is transported and shall show absolutely no leakage. The valve of the cylinder shall not be loosened or tampered with after this test and before or during transport.

Special packing provisions:

5. Bags and paper receptacles shall not be used for transporting this substance.

6. Bags and paper receptacles shall be water resistant.

7. Glass inner packagings are permitted in combination or composite packagings only if the substance is free from hydrofluoric acid. (UN 2439, 1811, 2699, 1732, 1740, 1775, 1776, 1778 and 1782)

8. Nitroglycerin solution in alcohol may be transported under this entry only when the solution is packed in metal cans of not more than 1 L capacity each, overpacked in a wood box containing not more than 5 L. Metal cans shall be completely surrounded with absorbent cushioning material. Wood boxes shall be completely lined with a suitable material impervious to water and nitroglycerin. (UN 3064)

9. If the substance is impregnated with less than 5% oil, it is excepted from the labelling requirements in Part 5 and the packaging tests in Part 6. (UN 1364)

10. Plastics packagings are not authorized. (UN 1697, 1695 and 2360)

11. Multi-wall paper bags are only authorized if transported in closed transport vehicles. (UN 1350)

12. Steel single packagings are not authorized. (UN 1185)

13. Aluminium materials of construction are not authorized for single packagings. (UN 1185, 1695, 1697)

14. Aluminium drums are not authorized. (UN 1697, 2487, 2474, 2471, 2574, 1699, 1699, 1701, 2788, 1916, 1737, 2788, 1738)

15. Aluminium construction materials are not authorized for any part of a packaging which is normally in contact with the substance. (UN 1154, 1182, 1183, 1196, 1204, 1238, 1242, 1244, 1250, 1277, 1278, 1280, 1295, 1298, 1305, 1326, 1333, 1339, 1341, 1343, 1352, 1358, 1369, 1378, 1381, 1382, 1385, 1389, 1392, 1402, 1407, 1409, 1411, 1419, 1421, 1422, 1423, 1428, 1437, 1445, 1452, 1453, 1458, 1459, 1461, 1462, 1471, 1472, 1483, 1485, 1491, 1495, 1496, 1504, 1506, 1513, 1541, 1670, 1695, 1697, 1699, 1717, 1723, 1724, 1727, 1728, 1737, 1738, 1740, 1744, 1747, 1748, 1750, 1751, 1752, 1753, 1758, 1762, 1763, 1764, 1765, 1766, 1767, 1768, 1769, 1771, 1775, 1776, 1778, 1781, 1782, 1784, 1786, 1790, 1791, 1799, 1800, 1801, 1804, 1805, 1806, 1807, 1808, 1809, 1810, 1811, 1816, 1824, 1828, 1829, 1830, 1831, 1832, 1834, 1836, 1837, 1839, 1871, 1905, 1906, 1908, 1916, 1921, 1932, 1938, 1940, 2008, 2208, 2240, 2257, 2258, 2308, 2435, 2438, 2439, 2441, 2442, 2443, 2444, 2447, 2471, 2474, 2487, 2502, 2509, 2534, 2545, 2546, 2547, 2564, 2574, 2691, 2692, 2699, 2734, 2735, 2740, 2741, 2788, 2796, 2817, 2837, 2869, 2879, 2881, 2983)

16. Aluminium or aluminium alloy construction materials are permitted only for halogenated hydrocarbons that will not react with aluminium.

17. Metal construction materials are not authorized for any part of a packaging which is normally in contact with the substance. (1310, 1320, 1321, 1322, 1336, 1337, 1344, 1348, 1349, 1354, 1355, 1356, 1357, 1394, 1517, 1722, 1739, 1774, 1787, 1788, 1789, 1792, 1798, 1802, 1803, 1873, 1939, 2429, 2576, 2852)

18. 1A1 drums made of carbon steel with thickness of body and heads of not less than 1.3 mm and with a corrosion-resistant phenolic lining are authorized for stabilized benzyl chloride if tested and certified to the Packing Group I performance level at a specific gravity of not less than 1 8. (UN 1738)

19. Metal drums are permitted as single packagings only if constructed of nickel or monel. (1738, 1744, 1752, 1808, 1939, 2576)

20. Copper cartridges are authorized as inner packagings if the substance is not in dispersion. (1415, 1423)

21. Outage shall be sufficient to prevent cylinders or spheres from becoming liquid full at 55 °C. The vacant space (outage) may be charged with a non-flammable non-liquefied compressed gas if the pressure in the cylinder or sphere at 55 °C does not exceed 125 % of the marked service pressure. (UN 1647)

22. Combination packagings consisting of inner glass packagings with a capacity of not more than 1.0 L each or inner metal packagings with a capacity of not more than 5.0 L each, placed in strong outer packagings in accordance with packing instruction P003. (UN 3066)

23. Packagings consisting of tightly closed inner containers of glass, earthenware, metal or polyethylene, with a maximum net mass of 0.5 kg each securely cushioned and packed in outer wooden barrels or wooden or fibreboard boxes, with a maximum net mass of 15 kg in accordance with packing instruction P003 are authorized. (UN 1565, 1588, 1626, 1636, 1653, 1680, 1689)

24. Packagings consisting of tightly closed inner packagings of glass, earthenware or metal, securely cushioned and packed in outer wooden barrels or wooden or fibreboard boxes, with a maximum net mass of 2.5 kg in accordance with packing instruction P003 are authorized. (UN 1565, 1588, 1626, 1636, 1653, 1680, 1689)

25. For substances with not more than 25 % active ingredient by mass, packages consisting of inner metal packagings with a capacity of not more than 250 ml each, packed in strong outer packagings together with sufficient absorbent material to completely absorb the liquid contents are authorized and need not conform to the packaging test requirements of Chapter 6.1 (UN 3017, 3018, 1611).

26. For substances with not more than two percent active ingredients by weight, packagings need not conform to the packaging test requirements of Part 6, if liquid contents are absorbed in an inert material. (UN 1611)

27. Packagings consisting of inner glass, earthenware, or polyethylene or other non-fragile plastics bottles or jars with a maximum net mass of 0.5 kg each, or metal cans with a maximum net mass of 5 pounds (2.27 kg) each, packed in outer wooden boxes, barrels or kegs, or fibreboard boxes are authorized and need not conform to the packaging test requirements of Chapter 6.1. The net mass of contents in fibreboard boxes shall not exceed 29 kg. The net mass of contents in wooden boxes, barrels or kegs shall not exceed 45 kg. (UN 1671)

28. Packagings consisting of tightly closed metal inner packagings with a maximum net mass of 0.5 kg each, packed in outer wooden or fibreboard boxes, or wooden barrels, are authorized and need not conform to the packaging test requirements of Chapter 6.1. The net mass of contents shall not exceed 15 kg. (UN 1575)

29. Packagings consisting of one inner metal can, with a maximum net mass of 2.5 kg, packed in an outer wooden or fibreboard box, or a wooden barrel, are authorized and need not conform to the packaging test requirements of Chapter 6.1. (UN 1575)

IBC Special packing provisions:

B1 Only authorized in metal IBCs.

B2 IBCs shall be provided with a device to allow venting during transport. The inlet to the pressure relief valve shall be sited in the vapour space of the IBC under maximum filling conditions during transport.

B3 Flexible IBCs (13M2) shall be fitted with a coating or liner.

B4 Flexible, fibreboard or wooden IBCs shall be sift-proof and water-resistant.

B5 Not authorized in 31HZ2 composite IBCs.

B6 Not authorized in flexible IBCs.

ANNEX 4

METHODOLOGY FOR ASSIGNING PACKING INSTRUCTIONS

CLASS OR DIVISION	SUBSIDIARY RISK	PACKING GROUP	PACKAGING INSTRUCTION
2.1	Irrespective of sub-risk	-	P200 Ethyl chloride-P201
2.2	Irrespective of sub-risk	-	P200
2.3	Irrespective of sub-risk	-	P200 Ethlene oxide-P202
3	-	I	P001
3	6.1	I	P001
3	8	I	P001
3	6.1/8	I	P001
3	-	II	P001
3	6.1	II	P001
3	8	II	P001
3	6.1/8	I	P001
3	-	III	P001
3	6.1	III	P001
3	8	III	P001
4.1	-	I	P001
4.1	6.1	I	P001 Barium Azide-P403
4.1	-	II	P002
4.1 Self-Reactive Substance	-	II	P520
4.1	6.1	II	P002
4.1	8	II	P002
4.1	-	III	P002
4.1	6.1	III	P002
4.1	8	III	P002

CLASS OR DIVISION	SUBSIDIARY RISK	PACKING GROUP	PACKAGING INSTRUCTION
4.2	-	I	P400 for Liquids P401 for Solids
4.2	4.3	I	P400
4.2	6.1	I	Pentaborane -P200 Phosphorus White or Yellow -P402
4.2	8	I	P400 for Liquids P401 for Solids
4.2	-	II	P002
4.2	6.1	II	P001 for Liquids P002 for Solids
4.2	8	II	P001 for Liquids P002 for Solids
4.2	-	III	P002
4.2	6.1	III	P001 for Liquids P002 for Solids
4.2	8	III	P001 for Liquids P002 for Solids
4.3	-	I	P001
4.3	3	I	P001
4.3	4.1	I	P001
4.3	4.2	I	P001
4.3	6.1	I	P001
4.3	8	I	P001 for Liquids P002 for Solids
4.3	3,8	I	P001
4.3	-	II	P001 for Liquids P002 for Solids
4.3	3	II	P001
4.3	4.1	II	P002
4.3	4.2	II	P002
4.3	6.1	II	P001 for Liquids P002 for Solids

CLASS OR DIVISION	SUBSIDIARY RISK	PACKING GROUP	PACKAGING INSTRUCTION
4.3	8	II	P001 for Liquids P002 for Solids
4.3	-	III	P001 for Liquids P002 for Solids
4.3	3	III	P001
4.3	4.1	III	P002
4.3	4.2	III	P002
4.3	6.1	III	P001 for Liquids P002 for Solids
4.3	8	III	P001 for Liquids P002 for Solids
5.1	-	I	P001
5.1	4.1	I	P004
5.1	4.3	I	P004
5.1	6.1	I	P001 for Liquids P002 for Solids
5.1	8	I	P001 for Liquids P002 for Solids
5.1	6.1/8	I	To be proposed in a separate paper
5.1	-	II	P001 for Liquids P002 for Solids
5.1	4.1	II	P004
5.1	4.3	II	P004
5.1	6.1	II	P001 for Liquids P002 for Solids
5.1	8	II	P001 for Liquids P002 for Solids
5.1	-	III	P001 for Liquids P002 for Solids
5.1	6.1	III	P001 for Liquids P002 for Solids
5.1	8	III	P001 for Liquids P002 for Solids

CLASS OR DIVISION	SUBSIDIARY RISK	PACKING GROUP	PACKAGING INSTRUCTION
5.2 Organic Peroxides	-	II	P520/P521/P522
6.1	-	I	P001
6.1(TIH)	-	I	To be proposed in a separate paper Hydrogen cyanide-P200/SPP4 Hydrocyanic acid-P200/SPP4
6.1	3	I	P001
6.1(TIH)	3	I	To be proposed in a separate paper Nickel carbonyl-P200
6.1	4.1	I	P001
6.1	4.2 pyrophoric	I	To be proposed in a separate paper
6.1	4.2 self-heating	I	P001
6.1	4.3 (TIH)	I	To be proposed in a separate paper
6.1	4.3 (not TIH)	I	P001
6.1	5.1 (TIH)	I	To be proposed in a separate paper
6.1	5.1 (not TIH)	I	P001
6.1	8 (TIH)	I	To be proposed in a separate paper
6.1	8 (not TIH)	I	P001
6.1	3,8 (TIH)	I	To be proposed in a separate paper
6.1	-	II	P001 for Liquids P002 for Solids
6.1(TIH)	-	II	To be proposed in a separate paper
6.1	3	II	P001 for Liquids P002 for Solids

CLASS OR DIVISION	SUBSIDIARY RISK	PACKING GROUP	PACKAGING INSTRUCTION
6.1(TIH)	3	II	To be proposed in a separate paper Bromoacetone-P603 Chloropicrin-P603 Chloropicrin mixtures, nos-P603
6.1	4.1	II	P002
6.1	4.2 self-heating	II	P002
6.1	4.3 (not TIH)	II	P001for Liquids P002 for Solids
6.1	5.1 (not TIH)	II	P001for Liquids
6.1	8 (not TIH)	II	P001for Liquids P002 for Solids
6.1	3,8	II	P001
6.1	-	III	P001for Liquids P002 for Solids
6.1	3	III	P001
6.2	-	-	P620/P621
7	-	-	To be developed
7	4.2 (pyrophoric)	-	To be developed
7	5.1	-	To be developed
7	8	-	To be developed
8	-	I	P001
8	3	I	P001
8	3,6.1	I	P001
8	4.1	I	P001
8	4.2 (self-heating)	I	P001
8	4.3	I	P001
8	5.1	I	P001
8	5.1/6.1 (Nitric acid red fuming only)	I	To be proposed in a separate paper

CLASS OR DIVISION	SUBSIDIARY RISK	PACKING GROUP	PACKAGING INSTRUCTION
8	6.1 (TIH)	I	To be proposed in a separate paper
8	6.1 (not TIH)	I	P001
8	-	II	P001for Liquids P002 for Solids
8	3	II	P001
8	4.1	II	P002
8	4.2 self-heating	II	P001 for Liquids P002 for Solids
8	4.3	II	P001 for Liquids P002 for Solids
8	5.1	II	P001 for Liquids P002 for Solids
8	6.1 (TIH)	II	To be proposed in a separate paper
8	6.1 (not TIH)	II	P001 for Liquids P002 for Solids
8	3, 6.1 (TIH)	II	To be proposed in a separate paper
8	3,6.1	II	P001
8	-	III	P001 for Liquids P002 for Solids Gallium-P803 Mercury-P804
8	6.1	III	P001 for Liquids P002 for Solids
9	-	II	P001 PCBs-P003 Asbestos-P900
9	-	III	P001 for Liquids P002 for Solids Zinc Dithionite-P003 Carbon dioxide, solid-P901 Fish meal-P902 Polymeric beads-P903

ANNEX 5

METHODOLOGY FOR ASSIGNING IBC PACKING INSTRUCTIONS

CLASS OR DIVISION	SUB-RISK	PG	IBC Packing Instructions
3	-	I	No PG I Liquids
3	6.1	I	No PG I liquids
3	8	I	No PG I liquids
3	6.1/8	I	No PG I liquids
3	-	II	IBC01
3	6.1	II	IBC01, B5
3	8	II	IBC01, B5
3	6.1/8	II	IBC01, B5
3	-	III	IBC01
3	6.1	III	IBC01
3	8	III	IBC01
4.1	-	I	No PG I liquids
4.1	6.1	I	None
4.1	-	II	IBC02, B3, B4
4.1 Self-Reactive Substance	-	II	None
4.1	6.1	II	IBC02, B3, B4
4.1	8	II	IBC02, B3, B4
4.1	-	III	IBC02, B3
4.1	6.1	III	IBC02, B3
4.1	8	III	IBC02, B3
4.2	-	I	No Division 4.2 PG I substances
4.2	4.3	I	No Division 4.2 PG I substances
4.2	6.1	I	No Division 4.2 PG I substances
4.2	8	I	No Division 4.2 PG I substances

CLASS OR DIVISION	SUB-RISK	PG	IBC Packing Instructions
4.2	-	II	Liquids-IBC01 Solids- IBC02, B3, B4
4.2	6.1	II	Liquids-IBC04 Solids- IBC02, B3, B4
4.2	8	II	Liquids-IBC04 Solids- IBC02, B3, B4
4.2	-	III	Liquids-IBC01 Solids-IBC02, B3
4.2	4.3	III	Solids-IBC03
4.2	6.1	III	Liquids-IBC01 Solids-IBC02, B3
4.2	8	III	Liquids-IBC01 Solids-IBC02, B3
4.3	-	I	No PG I Liquids Solids- IBC03, some not allowed in IBCs on a case by case basis.
4.3	3	I	No PG I Liquids
4.3	3,8	I	No PG I Liquids
4.3	4.1	I	None, except UN3132-IBC03, B1
4.3	4.2	I	IBC03, B1 unless the subsidiary hazard is PG III then IBC03 and no B1.
4.3	6.1	I	Liquids-No PG I Liquids Solids-IBC03, B1 unless the subsidiary hazard is PG III then IBC03 and no B1.
4.3	8	I	Liquids-No PG I Liquids Solids-IBC03, B1 unless the subsidiary hazard is PG III then IBC03 and no B1.
4.3	3,8	I	None
4.3	-	II	Liquids-IBC01 Solids-IBC02, B4
4.3	3	II	IBC01
4.3	4.1	II	IBC03, B4
4.3	4.2	II	IBC03, B4

CLASS OR DIVISION	SUB-RISK	PG	IBC Packing Instructions
4.3	6.1	II	Liquids-IBC04, unless the subsidiary hazard is PG III then IBC01 Solids-IBC03, B4
4.3	8	II	Liquid-IBC04, unless the subsidiary hazard is PG III then IBC01 Solid-IBC03, B4
4.3	-	III	Liquids-IBC01 Solids-IBC02, B3, B4
4.3	3	III	IBC01
4.3	4.1	III	Liquids-IBC01 Solids-IBC02, B3, B4
4.3	4.2	III	IBC02, B3, B4
4.3	6.1	III	Liquids-IBC01 Solids-IBC02, B3, B4
4.3	8	III	Liquids-IBC01 Solids-IBC02, B3, B4
5.1	-	I	IBC01, some substances not allowed on a case by case basis.
5.1	4.1	I	No PG I Liquids Solids-IBC05
5.1	4.3	I	No PG I Liquids Solids-IBC05
5.1	6.1	I	No PG I Liquids Solids-IBC05, UN3087-IBC03
5.1	8	I	No PG I Liquids Solids-IBC05
5.1	6.1/8	I	None
5.1	-	II	Liquids-IBC01 Solids-IBC02, B4
5.1	4.3	II	IBC05
5.1	6.1	II	Liquids-IBC01 Solids-IBC02, B4
5.1	8	II	Liquids-IBC04 Solids-IBC02, B4
5.1	-	III	Liquids-IBC01 Solids-IBC02, B3

CLASS OR DIVISION	SUB-RISK	PG	IBC Packing Instructions
5.1	6.1	III	Liquids-IBC01 Solids-IBC02, B3
5.1	8	III	Liquids-IBC01 Solids-IBC02, B3
5.2 Organic Peroxides	-	II	Organic peroxides per organic peroxide tables
6.1	-	I	No PG I liquids. Solids-IBC03
6.1(TIH)	-	I	No PGI liquids.
6.1	3	I	No PGI liquids.
6.1(TIH)	3	I	No PGI liquids.
6.1	4.1	I	Solids-IBC03
6.1	4.2 pyrophoric	I	No pyrophorics
6.1	4.2 self-heating	I	None
6.1	4.3	I	None
6.1	5.1	I	None
6.1	8	I	No PG I liquids Solids-IBC03
6.1	3,8	I	No PGI liquids
6.1	-	II	Liquids-IBC01 Solids-IBC02, B4
6.1	3	II	IBC01, B5
6.1	4.1	II	IBC02, B4
6.1	4.2 self-heating	II	IBC02, B4
6.1	4.3	II	Liquids-IBC01, B5 Solids-IBC02, B3, B4
6.1	5.1	II	Liquids-IBC01, B5 Solids-IBC02, B4
6.1	8	II	Liquids-IBC01, B5 Solids-IBC02, B4

CLASS OR DIVISION	SUB-RISK	PG	IBC Packing Instructions
6.1	3,8	II	IBC01, B5
6.1	-	III	Liquids-IBC01 Solids-IBC02, B3
6.1	3	III	IBC01
6.2	-	-	None
7	-	-	None
7	4.2 (pyrophoric)	-	None
7	5.1	-	None
7	8	-	None
8	-	I	No PGI liquids Solids-IBC03
8	3	I	No PG I liquids
8	3,6.1	I	No PG I liquids
8	4.1	I	IBC03
8	4.2 (self-heating)	I	No PG I liquids Solids-IBC03, B1
8	4.3	I	No PG I liquids Solids-IBC03, B1
8	5.1	I	No PG I liquids Solids-IBC03, B1
8	5.1/6.1 (Nitric acid red fuming only)	I	None
8	6.1 (TIH)	I	None
8	6.1 (not TIH)	I	No PG I liquids Solids-IBC03, B1 unless the subsidiary hazard is PG III then IBC03 and no B1.
8	-	II	Liquids-IBC01 Solids-IBC02
8	3	II	IBC01, B5
8	4.1	II	IBC02, B4

CLASS OR DIVISION	SUB-RISK	PG	IBC Packing Instructions
8	4.2 self-heating	II	Liquids-IBC01 Solids-IBC02, B4
8	4.3	II	Liquids-IBC01, B5 Solids-IBC03
8	5.1	II	Liquids-IBC01, B5 Solids-IBC03
8	6.1 (TIH)	II	None
8	6.1 (not TIH)	II	Liquids-IBC01, B5 Solids-IBC02, B4
8	3, 6.1 (TIH)	II	None
8	3,6.1(not TIH)	II	IBC01
8	-	III	Liquids-IBC01 Solids-IBC02, B3
8	6.1	III	Liquids-IBC01 Solids-IBC02, B3
9	-	II	Liquids-IBC01 Solids-IBC02
9	-	III	Liquids-IBC01 Solids-IBC02